

## The Heartware of a Smart Nation

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On 11 August 2017, the Land Transportation Authority (LTA) Singapore announced that bus and train rides would be paid for using only travel cards, and top-ups with cash would no longer be available. A spokesperson from LTA said, “... a fully cashless public transport system will be an important step in Singapore’s quest to become a cashless society and a Smart Nation.” Removal of cash top-up services from all train stations is part of the move towards a fully cashless public transport system by 2020.<sup>(1)</sup> As the first step, passenger service centres at 11 train stations terminated their cash top-up services soon after the announcement. Meanwhile, figures from LTA show that 69 percent of Singaporeans use cash as their preferred top-up method, such that the new measure will affect the majority of commuters.<sup>(2)</sup>

The rail system in Singapore, known as the Mass Rapid Transit (MRT), is a major means of transport with over three million rides per day in a city state of 5.6 million people. Among the riders, there are school-going children who may not have a bankcard and elderly commuters who may have never used an auto-ticketing machine. Since some commuters are unfamiliar with the cashless option, would the sudden removal of cash top-up services be a smart move? When digital services become the only option, it is a technological progress, but not necessarily “smart” for all people because many of them may find themselves inconvenienced.

### The Government Heartware—Strategic Shifts

Politicians often advocate leaving no one behind in the transition to a digital economy. Efforts are under way to provide access and adoption of digital technologies and at the same time ensuring that everyone is included, especially those who are economically or socially disadvantaged. Nevertheless, not everyone benefits from a digital society in the same way.

A recent research shows that ‘usability divide’ and ‘empowerment divide’ typically exist.<sup>(3)</sup> While usability divide refers to inequality caused by the disparity in skills to utilise digital technologies, empowerment divide refers to the gap that results from different propensities to harness digital opportunities. These divides contribute to inequality in participation, despite technological advancements that make digital devices and services easier to use. This phenomenon has persisted where the majority of users do not contribute to online networks and communities, and most contributions are made by a very small minority of users.

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Noticeably, building a Smart Nation is more than the provision of hardware, software, and applications. According to a Singapore government website, “Singapore strives to become a Smart Nation to support better living, stronger communities, and create more opportunities, for all. And ‘smartness’ is not a measure of how advanced or complex the technology being adopted is, but how well a society uses technology to solve its problems and address existential challenges. Citizens are ultimately at the heart of our Smart Nation vision, not technology!”<sup>(4)</sup> We call this the government’s ‘heartware’ of a Smart Nation.

In his article “How to have a Smart Nation for everyone,”<sup>(5)</sup> Mr. Janil Puthuchear, the Senior Minister of State, Singapore Ministry of Communications and Information and Ministry of Education, named three strategic shifts to ensure that all Singaporeans can participate and benefit:

1. Design with the user in mind

It is a shift from merely providing services to designing with the user in mind. Whether designing government e-services or technologies used in the home, the user interface must be easy to use for everyone.

2. Redefine digital access to include equipping people with skills

There is a need to define digital readiness as being more than having access to technological devices but also having the skills to use digital technology safely and confidently.

3. Collaborate across organisational boundaries

The Ministry of Communications and Information has set up a Digital Readiness Workgroup to study the issues related to building digital readiness in Singaporeans. Workgroup members come from organisations across the public, private and people sectors.

The Senior Minister’s strategic shifts are wise directives in tackling the smart nation effectiveness to secure a successful outcome. However, we must bear in mind that the devil is in implementation.

## **The Citizen Heartware—Technology Acceptance**

Besides providing access to a device and Internet connection, citizens must be equipped with knowledge and skills, accept and use digital technologies creatively to enhance their living in order to unlock the full benefits of a smart nation. A number of factors influence their decision about accepting and using a technology, notably, the perceived usefulness and ease of use.<sup>(6)</sup>

Back in 2009, LTA launched the Green Man Plus initiative at locations with nearby health facilities and transport nodes. It allows elderly and disabled pedestrians to have more time to cross the road when using signalised pedestrian crossings. They can activate the Green Man Plus function by tapping their smart travel cards on the card readers mounted above the push button on traffic light poles. The traffic light system will then recognize their cards and give longer ‘green man’ time for pedestrian crossings. For disabled pedestrians, there will also be a sound alert and two vibration alerts to let them know that the crossing time has been extended. With positive feedback and suggestions, the scheme has been expanded to more locations. To date, the Green Man Plus system was activated up to 50

times each day at high-usage crossings.<sup>(7)</sup>

Leveraging on Smart Card technology, the Green Man Plus scheme has been successful, providing apparent benefits for elderly and disabled pedestrians. At the same time, it is very easy to use, just ‘tap, wait and go.’ In order to create an inclusive smart nation, which includes those who are less advantaged, besides providing access to digital devices and technologies, the target users must accept and use the technology with delight. The smart nation project should gain the heartware of the citizens.

### **The Business Heartware—Building an Ecosystem**

According to Mr. Janil Puthucheary<sup>(8)</sup>:

*“The Smart Nation initiative will have an impact at three levels. It will transform our **country** so that we continue to be economically competitive and vibrant. It will create jobs for individuals and opportunities for **businesses**. It will provide better services and more convenience for every citizen, making life better at a **personal** level. All three levels are important and inter-connected. But it is at the personal level that we need to put in the extra effort to ensure that the Smart Nation is for everybody.”*

He also mentioned, “The blueprint for digital inclusion needs to be articulated by design. The Smart Nation transition will thus create benefits and opportunities for individuals as well as for businesses.”

The collaborative ecosystem fostered by the government and private sector supports Singapore’s transition into a Smart Nation. Government ministries are to provide adequate support for startups. The Singapore government has invested in setting up various startup accelerators to build a startup ecosystem which is actively supported by the business organizations. Lately, the Singapore government has set up SGInnovate to ‘tackle hard problems’ that matter to smart nation development and people around the world.<sup>(9), (10)</sup>

SGInnovate is established to help ambitious and capable people and startups to build ‘technology-intensive’ products borne out of research. Its strategy is to establish a global startup hub with unique ties to ASEAN, Asia, North America and Europe, creating a gateway for exciting new opportunities and resources. SGInnovate has planned to bring together over 7000 regional and global corporations that would provide go-to-market help, joint product development, investment funding and possible exits.

### **The Development Heartware—Managing Talents and Agility**

Organizations in Singapore hire foreign talents for IT, engineering, business, finance and R&D works. Often they justify their action by citing the shortage of highly skilled local talent. Yet, many corporate leaders have overlooked their responsibility to develop new capabilities of local employees and nurture the employees by assigning them to in-house projects. Such lack of development culture is compounded by the risk-avoiding leaders. We call this ‘lack of staff development heartware’ and it has

to be addressed urgently to ensure sustainability of a smart nation.<sup>(11)</sup>

The creation of a smart nation is a human endeavor with hardware and software as enablers. A Smart Nation is a vision set by the government, a rally to mobilize citizens in the country to share a dream, a design that should be co-created amongst government, citizens and business for a compelling outcome, a journey that has no end point as smartness is evolving over time with emerging new technologies, an exploration for new discovery and innovation, and an ambition to bring prosperity to business and quality life for citizens. A smart nation is therefore a complex undertaking which needs leadership, management, resources, innovation, technologies, operations and partnerships.

Underlining such complex ambition is the human ingenuity. Affected by an increasingly disruptive digital and globalized world, a smart nation development encompasses the development of human capital, strategies, policies, budgets, funding schemes, legislations and regulations. While adaptability is the ability to cope with change, agility is another important factor to manage disruptive change. Agility is the speed and ability to learn from experience and then apply that learning to perform successfully under new situations. Yet, most of the today's development for human capital, policies, budgets, and funding schemes are using traditional waterfall methodology which is suitable for traditional construction and manufacturing workflows that are in a sequential manner, going through typical steps of requirements, seeking inputs from stakeholders, design, construction, testing, implementation and maintenance. Such approach has been proven rigid and slow in coping with changes, often ineffective for high tech projects and inhibiting innovation. Owing to its top down management structure and lack of timely regular reviews and testing with participation by stakeholders, the outcome is often not ideal and full of shortcomings.

A new agile development approach is becoming more popular whereby it is not only suitable for high tech software development to facilitate innovation but also highly effective for non-software projects such as development of products, services, human capital, policies, funding schemes, budgets and so forth. Agile development is prescribing close collaboration of users/citizens, product/service management team, developers and quality assurance team to bridge the gaps through rapid multiple iterations of design, development, testing, implementation and reviews throughout the life cycle of development. As a result, agile methods are responding faster and effectively to an increased pace of changes. The stakeholders are walking the journey together during every iteration of the development life cycle. It is therefore an ideal approach to deal with disruption as it is adjusting or correcting rapidly in responding to changes. The approach allows new ideas to be tested stepwise and introduced in a continuous manner to meet the needs of the citizens or users. Agile development approach inculcates paradigm shift, and it is summarized in the table below.

## Differences in Heartware

### Waterfall Development

- Stakeholders input upfront
- Top Down Lifecycle
- Changes are slow (or discouraged)
- Rigid or Over-Standardization
- Stable
- Control
- Passive users

### Agile Development

- Stakeholders input throughout
- Iterative Lifecycle
- Changes are constant and welcome
- Adaptive
- Agile
- Empowered to change
- User actively co-create

### Closing Remarks

In conclusion, a new heartware is needed for leaders and builders of smart nation, who are developing policies, innovative products and services for future economy. An agile approach would help in coping uncertainty and disruption. Here is a list of characteristics describing people who are practicing agility:

1. Applying design thinking
2. Acting fast, nimble, and adaptively
3. Seeking feedback
4. Working effectively in team
5. Practicing continuous improvement
6. Regularly reviewing with stakeholders
7. Practicing self-awareness
8. Being open to experiment
9. Highly motivated to learn and self-learning
10. Empowering teams and allowing failure
11. Learning from failure
12. Conducting reflection

Developing a smart nation is about creating a better life for citizens, a conducive environment for businesses, and responsive and effective government services. In this regard, instead of being on the receiving or giving end of smart initiatives, citizens, business professionals, leaders, and government officials should be empowered to collaborate, contribute, innovate and co-create a digital society with an agility approach.

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